

**PUNJAB RESILIENT AND INCLUSIVE AGRICULTURE TRANSFORMATION  
(PRIAT) PROJECT**

**TERMS OF REFERENCES (TORs)  
OF**

**MONITORING & EVALUATION CONSULTANTS (M&ECs)**

**A. INTRODUCTION**

The agriculture sector has become more vulnerable to water shortages and climate change due to its geographic, climatic, and economic settings. Despite massive potential and significant contribution of irrigated agriculture, its performance remained below the achievable potential. An integrated approach based on upgrading the farm level community water conveyance infrastructure, equipping farmers with modern irrigation technologies, promotion of climate smart agriculture production practices, crop diversification, value addition, together with creating an enabling environment for sustained technology transfer at the grassroots level for optimal and efficient management of resources, is direly needed for sustainability of irrigated agriculture in the Punjab. Punjab Resilient and Inclusive Agriculture Transformation (PRIAT) aims at maximizing the productivity viz profitability of available resources (especially water) by minimizing losses at various levels to ensure its equity, adequacy, reliability, and sustainability at the farm level. Project Development Objective (PDO) of PRIAT is to enhance equitable access to water and productivity & profitability of farmers in project areas.

**B. PROJECT COMPONENTS**

The major activities to be carried out under the project would include, inter alia, the followings.

**1) Component-1: Community-driven Improvement of Water Conveyance and Application**

**Sub-Component 1.1: Upgrading Community Water Conveyance Infrastructure**

- a) Improvement of **1,000** unimproved watercourses
- b) Extension of lining on **2,000** partially improved watercourses (upto 50% optimal lining)
- c) Reconstruction and extension of lining on **1,000** outlived watercourses
- d) Development of **3,000** irrigation schemes outside canal commands and riverine areas

**Sub-Component 1.2: Improving Community Water Management**

- a) Improving Community Water Management (pilot test of water accounting & budgeting, promotion of climate practices, ICT based irrigation advisory, soil moisture meters, groundwater management/ monitoring, etc.)

**2) Component-2: Promotion of Climate Smart High Value Production, Regenerative Agriculture, Crop Diversification, Agriculture Value Addition, and Inclusive Access to Markets**

**Sub-Component 2.1:** Promotion of Regenerative Agriculture, Crop Diversification, Harvesting, Processing, Agriculture Value Addition, and Inclusive Access to Markets

**Sub-Component 2.2:** Promotion of Climate Smart High Value Production Practices & Technologies

- a) Installation of high efficiency irrigation systems (HEIS) on **40,000** acres
- b) Installation of solar systems for operating HEIS on **20,000** acres
- c) Provision of certified climate smart orchard plants and vegetable seeds/ seedlings on **5,000** acres
- d) Development of **1,000** on-farm water storage / rainwater harvesting ponds

**3) Component-3: Project Management, Monitoring and Learning etc.**

- a) Project implementation supervision & third-party validation consultants
- b) Project monitoring & evaluation consultants
- c) Awareness creation, capacity development, training, communication, strategic studies & research, buildings, technical assistance, machinery & equipment, etc.
- d) Project management and supervision (staff salaries, operational, etc.)

**4) Component-4: Contingent Emergency Response Component** to support preparedness and rapid response to disaster, emergency, and/or catastrophic events, as needed.

**C. M&E CONSULTING SERVICES**

Monitoring and Evaluation Consultants (M&ECs) will be hired for monitoring of project activities and evaluation of project impacts to ensure the achievement of Project Development Objectives (PDOs). Their main responsibilities will include (a) pre-implementation baseline evaluation; (b) implementation progress monitoring, including spot checking of works and quality of construction against agreed criteria and technical audits of the works completed and certified under the project; (c) M&E of the project's impacts including mid-term and final evaluation and rapid evaluations as required; and (d) M&E of the project's environmental and social management framework. The PMU-PRIAT will also have dedicated staff working on M&E activities who would act as counterparts to M&ECs. The consultants' team primarily works with PD-PRIAT, PMU/ DGA(WM) Punjab, Lahore but its major responsibilities will be in districts/ tehsils/ field areas.

The M&ECs will set up and implement an ICT-based participatory monitoring and evaluation system using Information and Communication Technologies (ICT) such as Global Positioning System (GPS), Geographic Information System (GIS), Remote Sensing (RS), Artificial Intelligence (AI), and so on. These technologies have now become important planning and monitoring tools worldwide. The project will support the use of these ICTs for development of web and mobile-based digital databases for project monitoring and reporting. The M&ECs key responsibilities would include but not limited to the followings:

- i) Provide technical assistance to DGA(WM) Punjab, Lahore/ PD-PRIAT for achievement of Project Development Objectives (PDOs)

- ii) Develop overall framework of monitoring and evaluation plan including collecting, analysing, and reporting project data for continual effective tracking of project development objectives
- iii) Work on formulated set of PDOs and key performance indicators and means of assessment against these indicators for project activities to be implemented
- iv) Monitor and evaluate the implementation of project activities (mid-term and final evaluation) and their outcomes and impacts on socio-economic welfare of farming community
- v) Propose recommendations about project modalities to ensure achievement of envisaged development objectives
- vi) Contribute to development of annual work plan, ensuring alignment with project strategy, agreement on annual targets and inclusion of M&E activities in the work plan
- vii) Measure agricultural productivity by assessing actual Evapotranspiration (ET) through RS and other field measurements
- viii) Oversee and execute M&E activities of water management practices and techniques with particular focus on results and impacts as well as in lesson learning
- ix) Set up and implement an ICT-based participatory monitoring and evaluation system for project monitoring and reporting
- x) Submit monthly, quarterly, and annual progress reports on PDO and Result Framework besides other periodic reports as per requirement of project management
- xi) Liaise with provincial, divisional, and district project management for better M&E of project activities and environment & social management framework
- xii) Work in close liaison with the PIS&TPV Consultants for effective implementation of project activities and achievement of PDOs
- xiii) Any other duty assigned by the project management.

#### **D. SPECIFIC DUTIES AND RESPONSIBILITIES OF M&ECs**

##### **Task-1: Monitoring of physical progress, identification of implementation issues, and suggestions for course correction/ resolution**

- i) Monitor progress toward the project's development, as outlined in the Project Appraisal Document (PAD)/ PC-I of the project
- ii) Refine performance indicators and reporting formats (including easy-to-read graphics) in consultation with DGA(WM) Punjab, Lahore/ PD(PRIAT)
- iii) Assist in monitoring of technical, environmental, social, economic etc. parameters to evaluate actual achievement against the activities planned in the PC-1 and/or PAD
- iv) Provide support in overall project management such as monitoring of project implementation plans, expenditure planning budgeting and financing forecast and plans, monthly, quarterly and annual reports as required by Client and financiers.

- v) Develop computer-based monitoring software/ Project Management Information System (PMIS) to monitor key performance indicators, visualization and production of useful reports, and track the project achievements as per planned targets
- vi) Recommend/ suggest improvement in project implementation for course correction and timely achievement of project targets
- vii) Provide training to project staff for use of the modernised versions. The Consultants will be responsible for sustainable operation of the PMIS during project period and will handed over the same to client in an orderly manner on project completion.
- viii) Maintain the PMIS software and hardware (health and compatibility) and software security against hacking, viral infections, etc.

## **Task-2: Impact Evaluation/ Assessment**

- i) Provide technical assistance to DGA (WM) Punjab, Lahore/ PD (PRIAT) for achievement of Project Development Objectives (PDOs)
- ii) Design and implement an overall monitoring & evaluation plan including collecting, analyzing, and reporting project data for continual effective tracking of PDOs
- iii) Evaluate the key performance indicators and means of assessment for project activities
- iv) Develop a standardized methodology for continual monitoring of project impact indicators given in result monitoring framework/ logical framework
- v) Monitor Agricultural Water Productivity (AEP) based on actual measurement of Evapotranspiration (ET) and as per instructions given in the PAD/ PC-I in close consultations with the Client and conformity to Bank's requirement
- vi) Propose recommendations about project modalities to ensure achievement of envisaged development objectives
- vii) Contribute in development of annual work plan, ensuring alignment with project strategy, agreement on annual targets and inclusion of M&E activities in the work plan
- viii) Oversee and execute M&E activities of water management practices and techniques with particular focus on results and impacts as well as in lesson learning
- ix) Develop formats including documentation for surveys, data analysis, photographs, interviews, etc. for impact assessment and the completion report
- x) Carry out baseline study/ survey, mid-term project assessment and final project evaluation
- xi) Carry out special impact assessment studies on requirement of the Client/ Donor. Tentative list of these studies is given below
  - Challenges that hinder development of horticulture industry at large scale in Punjab. Mango and citrus value chains have been studied quite extensively
  - Comparing performance of well-maintained earthen watercourses with lined watercourses, including impact of watercourse lining on cropping intensity and additional area brought under cultivation with water saving

- Comparing alternative agriculture investments vs. watercourse lining
  - Assessment of watercourse lining in non-canal command areas
  - Study on water losses and promoting high value agriculture will be conducted to prepare a sectoral and strategy plan for next 10 years to mitigate 30% conveyance, application and water use losses and promote high value agriculture as outlined in the National Water Policy
  - A comprehensive study/ sectoral plan encompassing the impact of on-going projects and delineating future requirements with projected timelines and resources needed to achieve the best landscaping of 39 million acres cultivable land of Punjab on food security, high value agriculture, high efficiency irrigation systems, cash crops, low and high-water intensive crops, etc. will be developed under the project
  - Study on behavioural change of farmers due to demonstration and capacity building activities
  - Study to assess the utilization factor & operation of solar vis-à-vis diesel and electric-driven tubewells
  - Study to assess impact of conjunctive use of surface and groundwater in watercourse command
  - Study on female engagement in irrigated agriculture
  - Study on sustainable promotion of high efficiency irrigation system in Punjab by studying global models
  - Other studies to be identified during project implementation
- xii) Submit quarterly/ bi-annual/ annual progress reports against PDOs
- xiii) Any other duty assigned by the Client

In the event of dispute which may result in legal action, adjudication or arbitration between the contract/supplier and the PIS&TPV Consultants, on the instruction of the Client, the M&ECs will continue to assist the Client to prepare factual documents which will describe the circumstances of dispute.

#### **E. GESTATION PERIOD**

The estimated duration of this consultancy services is 60 months (to be decided at the time of contract negotiation) covering the loan closing and grace period. However, contract period will be extendable as mutually agreed by both parties.

#### **F. SELECTION METHOD**

The consultants will be recruited in accordance with World Bank Procurement Regulations for IPF Borrowers Nov 2020 for selection of consultants using the Quality & Cost Based Selection (QCBS) method.

#### **G. CORE TEAM OF EXPERTS**

The consultants are encouraged to use the international expertise available to the extent

possible. However, experience of the World Bank financed projects is necessary to carry out the assignment. The consultants are free to propose a staffing plan and skill mix to ensure that necessary requisite objectives and scope of services are achieved. If all the required skills are not available within the consulting firms, they are encouraged to make joint ventures with other firms.

The Consultants shall ensure deployment of qualified competent staff to monitor and evaluate project impacts as well as to provide technical assistance etc. for successful accomplishment of envisaged PDO/ results. The team of experts required for this assignment will have sufficient experience of the related activities preferably in developed countries on successful models for promoting modern water management interventions, particularly water productivity assessment, high efficiency irrigation systems, agriculture value addition, processing, market integration, etc. under agriculture development projects. Following is the indicative core team of experts and support staff alongwith minimum academic qualification, experience and time input required. However, the actual time input required, job descriptions, deliverables, etc. of these experts will be finalized at the time of contract negotiation.

<b>Sr. No.</b>	<b>Position</b>	<b>Qualification and Experience</b>	<b>Man Months</b>
<b>A. Key Expert</b>			
1.	Project Manager/ M&E Expert (K-1)	<b>Qualification:</b> Master's degree in Agricultural Engineering/ Water Resources Management/ Water Engineering & Management/ Irrigation Engineering/ Civil Engineering/ Project Management or equivalent after gradation in Agricultural Engineering. <b>Experience:</b> Overall 15 years with seven (7) years in water sector foreign funded projects	60 (1 position)
2.	Agricultural Economist (K-2)	<b>Qualification:</b> Master's degree in Economics/ Agricultural Economics/ Development Economics or equivalent. <b>Experience:</b> Overall 10 years with seven (7) years in on farm water management projects.	60 (1 position)
3.	Water Accounting & Budgeting Specialist (K-3)	<b>Qualification:</b> Master's degree in Agricultural Engineering/ Hydrology/ Water Resources/ Irrigation Engineering/ or equivalent after gradation in Agricultural Engineering. <b>Experience:</b> Overall seven (7) years with three (3) years in on farm water budgeting/ accounting.	60 (1 position)
4.	Geographic Information System & Remote Sensing (RS&GIS) Specialists (K-4)	<b>Qualification:</b> Master's degree in Geographic Information System/ Remote Sensing/ equivalent. <b>Experience:</b> Overall seven (5) years with three (2) years in agriculture development projects.	120 (2 positions)
5.	Irrigation Agronomist (K-6)	<b>Qualification:</b> Ph.D. degree in Agriculture / Agricultural Engineering/ Water Resources/ Irrigation Engineering or its equivalent with specialization in Agronomy.	60 (1 position)

		<b>Experience:</b> Overall seven (7) years with three (3) years in on farm water management projects.	
6.	Environmental Specialist (K-7)	<b>Qualification:</b> Master's degree in Environmental Management/ Environmental Engineering/ Agricultural Engineering/ Water Resources or its equivalent with specialization in environmental management/ climate change. <b>Experience:</b> Overall seven (7) years with three (3) years in on farm water management projects.	60 (1 position)
7.	HEIS Specialist (K-8)	<b>Qualification:</b> Master's degree in Agricultural Engineering/ Water Resources Management/ Water Engineering & Management/ Irrigation Engineering/ or equivalent after gradation in Agricultural Engineering. <b>Experience:</b> Overall seven (7) years with three (3) years in M&E of HEIS.	60 (1 position)
8.	Information Technology (IT) Specialist (K-9)	<b>Qualification:</b> Master's Degree in degree in Computer Science/ Computer Engineering/ Information Technology/ Computer Programming or equivalent. <b>Experience:</b> Overall five (5) years with two (2) years in agriculture development projects.	60 (1 position)
9.	Climate Change Specialist (K-10)	<b>Qualification:</b> Master's degree in Climate Change/ Environment Management/ Environment Engineering/ Agricultural Engineering/ Water Resources or its equivalent with specialization in climate change/ equivalent <b>Experience:</b> Overall five (5) years with two (2) years in on farm water management projects.	60 (1 position)
10.	Agriculture Value Chain Specialist	<b>Qualification:</b> Post-graduate degree in Horticulture / Agri Marketing/ Agri Business Development/ Agriculture Engineering/ Total Quality Management or equivalent <b>Experience:</b> Overall seven (7) years' experience in horticulture, agriculture value chain and agriculture business development.	60 (1 position)
		<b>Total</b>	<b>660</b>
B.	Non-Key Experts/ Support Staff	Gender & Social Specialist, Agricultural Engineers, Assistant Agronomists, Soil Scientist, Data Analyst, Communication Specialist, Contract Manager, Field Surveyors/ Enumerators, Office Manager, support staff, etc.	

## **1. Project Manager/ M&E Expert**

**Qualifications:** The Project Manager (PM)/ M&E Expert will possess a Master's degree in Agricultural Engineering/ Water Resources Management/ Water Engineering & Management/ Irrigation Engineering/ Civil Engineering/ Project Management or equivalent after graduation in Agricultural Engineering. The PM/ M&E Expert should have an overall experience of 15 years with seven (7) years in water sector foreign funded projects, preferably World Bank financed with demonstrated ability to work with government officials, technical field staff, private sector, and farmers will be preferred. In addition, the Project Manager (PM)/ M&E Expert would be required to have familiarity with the principles and practices of participatory community development, irrigated agriculture, water management related issues, besides, having fluency in spoken and written English. Responsibilities of the Project Manager (PM)/ M&E Expert will include but not limited to the following:

- i) Act as the Team Leader of Consultant's team
- ii) Keep the Client informed about M&E related technical & managerial issues and progress by direct contacts and through discussions/ correspondence
- iii) Attend, at project level, all M&E related meetings as required and keep a record of all such meetings
- iv) Ensure preparation of regular project reports/ project completion report (PCR) as per deliverables
- v) Assist the Client in preparing responses to Audit observations as and when required
- vi) Assist the Client in preparing response to World Bank or other authority's queries, observations, requirements etc.
- vii) Provide technical input for course correction and smooth implementation of project activities
- viii) Supervise preparation and implementation of M&E and impact assessment plans
- ix) Monitor and guide achievement of PDOs and project objectives
- x) Supervise M&E staff for inspection of field activities to ensure adoption of specified standards & specifications
- xi) Coordinate with all project stakeholders for M&E and impact assessment
- xii) Report to Client/ DGA (WM) Punjab, Lahore/ PD (PRIAT) for smooth project management
- xiii) Any other task assigned by the project management

## **2. Agricultural Economist**

**Qualifications:** The Agricultural Economist will possess a Master's degree in Economics/ Agricultural Economics/ Development Economics or equivalent with 10 years of work experience including at least seven (7) years in implementation of water management projects at field level in agricultural and rural development sectors. The work experience in a developed country in related field particularly climate smart agriculture projects and demonstrated ability to work with government officials, technical field staff, private sector, and farmers would be preferred. Work



experience in related computer tools, World Bank rules/procedures, good communication skills, fluency in English, and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Agricultural Economist will include but not limited to the followings:

- i) Act as Deputy Project Manager in the absence of Project Manager
- ii) Supervise regular tracking of progress against PDOs given in the PAD/ PC-I
- iii) Develop a comprehensive plan for impact evaluation of project activities and ensure its implementation
- iv) Prepare formats for carrying out baseline and periodic surveys for establishing pre-project dataset and capturing temporal changes during the project implementation
- v) Lead the field staff in collection of periodic/ seasonal data, planning field activities, review of progress, impact assessment activities etc.
- vi) Collect, compile, and analyze data/ information of different project activities against PDOs
- vii) Assist in modification of project implementation plans based on information collected from the field on different aspects
- viii) Carry out economic analysis of various project activities based on field data
- ix) Submit annual report on economic impacts of project activities based on field data and information gathered from project beneficiaries
- x) Provide guidance and training on M&E concepts and tools to project stakeholders
- xi) Assist in carrying economic analysis/ business plans for regenerative agriculture machinery, harvesting, processing, value addition, etc. machinery
- xii) Lead surveys/information collection for impact assessment of project activities
- xiii) Any other relevant duties assigned by the project management

### **3. Water Accounting & Budgeting Specialist**

**Qualifications:** The Water Accounting & Budgeting Specialist will possess a Master's degree in Agricultural Engineering/ Hydrology/ Water Resources/ Irrigation Engineering/ or equivalent after graduation in Agricultural Engineering with overall seven (7) years experience with three (3) years in on farm water budgeting/ accounting. The work experience in a developed country in related field particularly on-farm water accounting & budgeting and demonstrated ability to work with government officials, technical field staff, private sector, and farmers would be preferred. Responsibilities of the Water Accounting & Budgeting Specialist will include but not limited to the followings:

- i) Develop a comprehensive framework for water resources assessments, water accounting/ budgeting and water productivity analyses at the watercourse level/ scale
- ii) Apply latest water accounting model/ framework and quantify water resources in the watercourse command for better planning, resource allocation, and sustainable management of water and other resources

- iii) Assist in strengthening farmers' capacity to measure, budget, optimize, sustainably use, and monitor the available water & other farm resources for enhancing land-water-energy-labour productivity and profitability in the watercourse command
- iv) Supervise field surveys and carry out measurements to document/ existing current resources available (surface & groundwater, land, soil, climate, tubewells, and other Agri resources) in the selected watercourse command
- v) Record existing practices, carry out farm audits & resource budgeting, and identify underlying constraints relating to imbalances in water supply & demand
- vi) Assist in preparing standards & specifications and procurement of smart gadgets/ instruments (digital soil moisture meters, ICT-based smart flumes, flow meters, tubewell discharge measurement devices, rainfall measurement, groundwater monitoring gadgets, soil & water kits, etc.)
- vii) Develop digital resource maps of selected watercourse command
- viii) Recommend optimal cropping pattern and farm layout to improve on-farm infrastructure including watercourse improvement/ lining, turnouts/ nakkas installation, Laser land leveling, installation of solar operated HEISs, construction of water storage ponds, and other technologies
- ix) Work closely with IT Expert for development of ICT-based mobile app and information system for irrigation advisory services in watercourse commands i.e., when to irrigate and how much to irrigate
- x) Assess the impact of water accounting & budgeting and crop optimization for enhancing the water productivity and profitability
- xi) Any other relevant duties assigned by the project management

#### **4. Geographic Information System & Remote Sensing (GIS & RS) Specialist**

**Qualifications:** Geographic Information System & Remote Sensing (GIS & RS) Specialist will possess a Master's degree in Geographic Information System/ Remote Sensing/ equivalent and five (5) years experience with two (2) years in agriculture development projects. The work experience in agricultural development/ water sector projects and demonstrated ability to work with government officials, technical field staff, private sector, and farmers would be preferred. Responsibilities of the GIS Specialist will include but not limited to the followings.

- i) Assist in identifying, locating, and obtaining access/licenses required for datasets, satellite imagery or land-use maps for development of project related maps and information
- ii) Provide expertise in GIS-based database development, management, data manipulation, and map generation
- iii) Develop GIS applications on different platforms (i.e. ESRI products/ ERDAS Imagine/ ER-Mapper / MapInfo etc.) for project activities
- iv) Develop shape files of all project interventions
- v) Carryout data digitization and geo-tagging of all project interventions
- vi) Develop user friendly maps of project activities and manage map production/ printing

- vii) Organize collection of necessary field data for completion, updating and up-gradation of GIS database
- viii) Assist the water accounting & budgeting specialist to assess actual evapotranspiration through RS techniques for measuring agricultural water productivity
- ix) Supervise image processing/ interpretation and analysis of project interventions
- x) Assist in data digitization and geo-tagging of all project interventions
- xi) Administer spatial data analysis and management
- xii) Build capacity of OFWM staff/IT team in operation, application and management of GIS/ RS database, use of GPS and latest GIS software i.e. ArcView, ArcGIS etc.
- xiii) Demonstrate ways to use OFWM GIS/ RS database as a management tool in an optimal manner for project planning & monitoring
- xiv) Produce GIS/RS project maps as and when required by the DGA (WM) Punjab, Lahore/ PD (PRIAT)
- xv) Any other relevant duties assigned by the project management

## **5. Irrigation Agronomist**

**Qualifications:** The Irrigation Agronomist (IA) will possess a Ph.D. degree in Agriculture / Agricultural Engineering/ Water Resources/ Irrigation Engineering or its equivalent with specialization in Agronomy and seven (7) years' experience with three (3) years in on farm water management projects, preferably adoption/promotion of modern water management interventions with sound knowledge of crop production technologies, particularly with improved and modern irrigation methods. In addition, the IA would be required to have demonstrated ability to work with government officials, technical field staff, private sector, and farmers and work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Irrigation Agronomist will include but not limited to the followings:

- i) Provide technical assistance to DGA(WM) Punjab, Lahore/ PD(PRIAT) for planning agronomic water management practices
- ii) Develop/ refine irrigation schedules to meet water requirement of various crops under local conditions
- iii) Formulate/ improve guidelines and technical manuals for OFWM professionals and farmers about agronomic aspects of water management and conservation techniques/technologies
- iv) Identify and recommend water efficient crop varieties based on soil and climatic conditions of the area
- v) Recommend plans for successful crop production including land preparation, planting, irrigation scheduling, inter-culture, fertigation, harvesting, processing, and marketing, etc. under modern water management interventions, particularly with HEIS
- vi) Provide agronomic support for training of technical staff and trainers involved in promotion of envisaged project interventions

- vii) Address issues and suggest solution to the problems related to crop production confronted by beneficiary farmers
- viii) Provide support for designing/ laying out of agronomic experiments as well as data collection for proper evaluation
- ix) Develop crop production plans/ guidelines/ manuals of various crops grown with HEIS and other modern irrigation systems
- x) Any other relevant duties assigned by the project management

## **6. Environmental Specialist**

**Qualification:** The Environmental Specialist will possess a Master's degree in Environmental Management/ Environmental Engineering/ Agricultural Engineering/ Water Resources or its equivalent with specialization in environmental management/ climate change and seven (7) years' experience with three (3) years in on farm water management projects. The Environmental Specialist would be required to have demonstrated ability to work with government officials, technical field staff, private sector, and farmers and work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Environmental Specialist will include but not limited to the followings:

- i) Oversee execution of the ESMF and assist in its implementation
- ii) Carry out field examinations and report hazardous activities/ materials
- iii) Develop and recommend solutions to address pollution and environmental hazards due to project interventions
- iv) Design and implement training programs in accordance with the ESMF at all levels
- v) Prepare monthly/ quarterly ESMF progress report and ensure its delivery to project stakeholders
- vi) Ensure appropriate tracking and evaluation of safety and environmental compliance assurance activities and information
- vii) Assess environmental benefits of project interventions and present in the monthly progress report
- viii) Any other relevant duties assigned by the project management

## **7. HEIS Specialist**

**Qualifications:** The HEIS Specialist will possess a Master's degree in Agricultural Engineering/ Water Resources Management/ Water Engineering & Management/ Irrigation Engineering/ or equivalent after gradation in Agricultural Engineering and seven (7) years experience with three (3) years in M&E of HEIS. The HEIS Specialist would be required to have demonstrated ability to work with government officials, technical field staff, private sector, and farmers and work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the HEIS Specialist will include but not limited to the followings.

- i) Provide technical assistance in estimating crop water requirements of major crops and compare those with water availability for crop cultivation with HEIS
- ii) Design HEIS crop production packages and facilitate their demonstrations on farmers fields
- iii) Guide the OFWM staff in identification and selection of appropriate irrigation methods for various areas and crop cultivation with HEIS
- iv) Prepare technical reports, guidelines, and training manuals to disseminate adoption/promotion of improved water management interventions, especially HEIS
- v) Assist in establishment of HEIS demonstration sites for showcasing improved water management and conservation techniques/technologies to farmers
- vi) Carry out a study to assess the potential of HEIS in the Punjab
- vii) Provide support in training of technical staff and master trainers involved in promotion of water management technologies
- viii) Locate successful HEIS models in developed countries and assist in arranging technology transfer through foreign visits/ trainings
- ix) Provide technical assistance to field staff for extending back up support to farmers about HEIS and new water management interventions
  - i) Address issues and suggest solution to the problems related to engineering aspects of irrigation methods/HEIS as confronted by the farmers
  - ii) Assist in evaluation and indigenization of improved water management techniques/HEIS under local conditions for their adoption by the farmer
  - iii) Any other relevant duties assigned by the project management

## **8. Information Technology (IT) Specialist**

**Qualification:** The IT Specialist will possess a Master's Degree in degree in Computer Science/ Computer Engineering/ Information Technology/ Computer Programming or equivalent and five (5) years' experience with two (2) years in agriculture development projects. The IT Specialist would be required to have demonstrated ability to work with government officials, technical field staff, private sector, and farmers and work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the IT Specialist will include but not limited to the followings.

- i) Design and develop a Project Management Information System (PMIS) and a web-based dashboard for M&E result monitoring framework for online tracking of PDOs and project progress
- ii) Develop a mobile-based application/ dashboard for higher project management
- iii) Provide support in determining emerging IT solutions through AI and IoT for efficient project management, develop plans & cost estimates, and integrate plans into the IT solutions
- iv) Prepare and deliver training programs to project staff for effective and trouble-free use of PMIS/ dashboard

- v) Carry out data extraction and various analysis for project management usage
- vi) Prepare user manual for PMIS and mobile-based application/ dashboard
- vii) Extend day-to-day IT operation support to Client regarding PMIS/ web-based dashboard
- viii) Arrange hosting of the PMIS on a secured platform and ensure its successful handing over to department
- ix) Any other relevant duties assigned by the project management

## **9. Climate Change Specialist**

**Qualifications:** The Climate Change Specialist will possess a Master's degree in Climate Change/ Environment Management/ Environment Engineering/ Agricultural Engineering/ Water Resources or its equivalent with specialization in climate change/ equivalent and five (5) years' experience with two (2) years in on farm water management projects. The Climate Change Specialist would be required to have demonstrated ability to work with government officials, technical field staff, private sector, and farmers and work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Climate Change Specialist will include but not limited to the followings.

- i) Develop a comprehensive climate change adaption plan
- ii) Carry out climate change impact analysis of different project interventions
- iii) Act as technical support arm for strategic planning, implementation, and coordination of climate change related activities
- iv) Apply latest models and assess reduction in GHGs emissions due to project interventions
- v) Assess current capacity development needs of staff and farmers and assist in organizing climate related trainings
- vi) Identify gaps and propose solutions for implementing climate smart water management interventions
- vii) Assist the M&E team in implementation of climate smart agriculture and water accounting/ budgeting activities
- viii) Carry out analysis of major impacts of water shortages/ droughts, unexpected and high-frequency rains, unusual increase in temperature on project interventions
- ix) Analyze economic, social, and environmental information to better understand adaptation and mitigation
- x) Collaborate with project stakeholders for promotion of climate smart and water resilient agriculture
- xi) Any other relevant duties assigned by the project management

## **1. Agriculture Value Chain Specialist**

**Qualifications:** Agriculture Value Chain Specialist should have a post-graduate degree in Horticulture / Agri Marketing/ Agri Business Development/ Agriculture Engineering/ Total

Quality Management or equivalent with seven (7) years' experience in horticulture, agriculture value chain and agriculture business development. The Specialist will be responsible for monitoring and provision of technical guidance & expertise for implementation of processing, value addition, market integration & regenerative agriculture component within the framework of prescribed policies and guidelines of the government and the World Bank. Major responsibilities of the Agriculture Value Chain Specialist will include, inter alia, the followings.

- i) Monitor regenerative agriculture machinery, processing, value addition, market integration, etc. activities
- ii) Assess the identification of clusters vis-à-vis crops for processing & value addition and provide assistance for improvement of process
- iii) Provide assistance to the PIS&TPV consultants' team for the development of standards & specifications of regenerative agriculture machinery, harvesting, value chain & processing, etc. machinery/ equipment
- iv) Help in preparing guidelines, operational documents, and annual plans
- v) Assess the impact of harvesting, processing, value addition, and marketing linkages activities
- vi) Assist in the development of business plans and feasibility studies for regenerative agriculture machinery, harvesting, value chain & processing, etc. machinery/ equipment
- vii) Provide support for developing direct linkages with leading food processing industries and other potential buyers to market their processed and value-added products and vice versa
- viii) Any other relevant duties assigned by the DGA (WM) Punjab, Lahore/ PD (PRIAT)/ project management

## **H. REPORTING REQUIREMENT AND TIME SCHEDULE FOR DELIVERABLES**

The Consultant will prepare the following reports in English/ Urdu and provide the copies as per deliverables and schedule alongwith respective soft copy.

- a) Inception Report – In this report, the Consultant will present their strategy, methodology, timeline, responsibility matrix, risk analysis, risk response methods etc. for successful delivery of consultancy services.
- b) Monthly Progress Reports
- c) Mid-term Report on the format acceptable to the Client
- d) Design Manuals of project activities
- e) Quality Assurance Plan - (QA/QC Manual)
- f) Revised Planning Commission Proforma-I (PC-I), if needed
- g) Assignment Completion Report (including digital database of all project interventions)
- h) Revised Planning Commission Proforma-IV (PC-IV)

- i) Any special reports as may be necessary from time to time for specific item / issue related to the project.

The schedule for various reports and documents that are likely to be generated by the Consultant has been prepared. Additional reports and presentations shall be prepared as required. The Consultants will supply the deliverables alongwith the respective soft copy thereof to the PPGA(WM) Punjab Lahore/ PD (PRIAT) as per schedule given below.

<b>Sr. No.</b>	<b>Document</b>	<b>Soft &amp; Hard Copies</b>	<b>Due</b>
1.	Draft Inception Report	2	3 weeks after the effectiveness of the services
2.	Final Inception Report	3	One week after the issuance of comments by the Client on draft Inception Report
3.	Monthly Progress Report (Physical & Financial)	1	10 <sup>th</sup> of the following month
4.	Quality Assurance Plan (QA/ QC Manual)	3	Within 45 days after commencement of services
5.	Quarterly Progress Report (Physical & Financial)	2	10 <sup>th</sup> of the first month of following quarter
6.	Annual Summary Progress Report (Physical & Financial)	2	10 <sup>th</sup> of the first month of following year
7.	PMIS/ Dashboard/ IT monitoring system	1	6 months after the effectiveness of the services
8.	Annual Progress Report (Physical & Financial)	2	During first month of the following year
9.	Impact Assessment Reports	2	After each year
10.	Summary of Progress against Result Framework/ PDOs	2	After each year, and as and when required
11.	Quality Control / Assurance Report	3	After each year
12.	GIS/ RS maps	3	After 6 months, and as and when required
13.	Social and environment progress report/ ESMF report	5	Quarterly
14.	Design/ PMIS manuals	3	Within 6 months after commencement of services
15.	Online PDO tracking system/ software	1	Within 3 months after commencement of services
16.	Revised Planning Commission Proforma-I (PC-I)	20	As and when required



17.	Draft Assignment Completion Report	5	At completion of physical works/ activities
18.	Final Assignment Completion Report	20	At completion of physical works and financial transactions
19.	Planning Commission Proforma IV (PC-IV)	50	At completion of the project
20.	Complete inventory of works/ activities in hard and digital form	5	At completion of the project
21.	Special Reports	3	As and when required

## **J. PROFESSIONAL LIABILITY OF THE CONSULTANT**

The consultants would be responsible for professional liability as per World Bank guidelines for recruitment of consultants as well as may also cover the followings

- i) The consultants selected and awarded the contract will be liable for the consequence of errors and omissions on their part or on the part of their employees
- ii) The consultant shall be held liable for all losses or damages suffered by the procuring agency on account of any misconduct by the consultant in performing the consulting services
- iii) The extent of liability of the consultant shall form part of the contract and such liability shall be in accordance with the relevant World Bank guidelines.
- iv) The consultants would also be liable for the consequences as per provisions contained in bye-laws of Pakistan Engineering Council for “Conduct and Practice of Consulting Engineers”
- v) The consultants will provide insurance for liabilities on part of the consultant @ 10 percent of contract cost and necessary costs shall be borne by the consultants in this regard
- vi) The consultants will not engage any person, who is paid employee of another consulting firm, works part-time in its offices or performs any piece of work or work on contract, until they have not obtained permission in writing of the Consultants who are the employer of such person
- vii) The consultants shall not make any offer of employment to employees of their Client and if they are approached by employees of their Client regarding employment with them, they shall make certain that they have their Client’s consent before entering into any negotiations with such employees
- viii) In case of any dispute between the consultants and Client, the matter shall be referred to the competent authority for arbitration as per Rules. The decision of the arbitrator shall be final and non-appealable

## **K. CLIENT'S INPUT AND COUNTERPART PERSONNEL**

- i) The Consultant shall work closely with the Director General Agriculture (Water Management) Punjab, Lahore/ Project Director (PRIAT), Lahore to whom they

will be reporting on day-to-day basis. The Consultant will establish their offices in Lahore and project areas at suitable places. Most of the consultants' staff will be located in the field/ project areas.

- ii) Director General Agriculture (Water Management) Punjab, Lahore/ Project Director (PRIAT) will be representative of the Client who will also resolve various administrative issues relating to Consultants arising during the course of assignment. The Consultants' Team Leader/ Project Manager will be the principal contact and will be expected to be readily available during project implementation.
- iii) The Consultants shall be responsible for all aspects of performance of services as set forth in these TORs.
- iv) All records and sites will be made available to the Consultant to enable them to perform their functions. The Consultants will be required to ensure confidentiality of the record.
- v) All relevant documents regarding on farm water management activities are freely accessible at OFWM website (<http://ofwm.agripunjab.gov.pk>), which may be useful for interested consultants/ consulting firms.